

## 5.2.2. Preflight and Built-In-Tests

### 5.2.2.1. Purpose

The purpose of this test is to assess the suitability of the SMS preflight and turn on procedure and the BIT to quickly and easily bring the SMS system on line and insure an operational system.

### 5.2.2.2. General

As airplanes become more expensive, fewer and fewer will be available to accomplish each mission, amplifying the loss of individual airplanes to inflight failures. Quick, accurate ground preflight tests are essential to determine system status while repairs can still be performed. A quick response/alert time is also important and so these checks must be expeditious and must allow the operator to prepare for the mission with a minimum of distractions. Limited airplane availability also implies the need for quick turnarounds to send the same aircraft out for successive missions. This necessitates a very short preflight and turn on procedure that can be accomplished safely and thoroughly before a hurried combat mission. SMS systems have the added requirement that the modification of the store load initialization data must be easy and quick since the modification is typically necessitated by a rapid mission driven load modification or stores failure.

### 5.2.2.3. Instrumentation

A stop watch, data cards and stores and/or stores test sets to simulate stores are required for this test. A voice tape recorder is optional.

### 5.2.2.4. Data Required

Qualitative comments, time to complete the preflight/turn on, time to complete the BIT and time to store the load initialization data is required. A record of BIT indications is required. Note the effort required to alter the store load after initialization.

### 5.2.2.5. Procedure

Perform a normal system preflight and turn on before each test flight using the published system check list. Note the times for SMS stores initialization, the external and internal preflights and the total system preflight time up to the ready for operate indications.

Perform a preflight BIT, noting the total BIT time and indications. Note any correlation between the BIT indications and the SMSs operation. Perform a complete system check out of the failure indications. Make qualitative comments as appropriate.

### 5.2.2.6. Data Analysis and Presentation

The time and complexity of the preflight procedures listed in the operator's checklist and SMS turn on/timeout procedure should be related to the expected alert launch time requirements and the overall operator workload during the alert launch. The BIT times and the amount of operator interface required to perform the BIT should be assessed in the same scenario. Clarity of the BIT indications should be related to the cockpit environment. The BIT indications should be related to actual SMS degradation and verified by ground technicians. Erroneous BIT false alarms should be noted and related to the probability of unnecessarily missed sorties. The time and effort to perform a change in the store load initialization data should be related to the necessity to make real time changes in the mission and loads for the aircraft.

### 5.2.2.7. Data Cards

Sample data cards are presented as cards 69 and 70.

CARD NUMBER \_\_\_\_\_

PREFLIGHT/TURN ON

CLARITY OF CHECKLIST INSTRUCTIONS:

LOGICAL SEQUENCE OF CHECKLIST:

THOROUGHNESS OF CHECKLIST:

SYSTEM STATUS/SMS TIMEOUT COMPLETE INDICATIONS:

TIME TO PERFORM EXTERNAL PREFLIGHT OF SMS \_\_\_\_\_

TIME TO PERFORM INTERNAL PREFLIGHT OF SMS \_\_\_\_\_

TIME TO STORE LOAD INITIALIZATION DATA \_\_\_\_\_

TOTAL PREFLIGHT TIME INCLUDING TIMEOUT \_\_\_\_\_

TIME TO MODIFY STORE LOAD INITIALIZATION DATA \_\_\_\_\_

EFFORT TO CHANGE STORE LOAD INITIALIZATION DATA:

292

CARD NUMBER \_\_\_\_\_

BUILT IN TESTS

INITIATION PROCEDURES:

RUN/FINISH INDICATIONS:

TIME TO PERFORM SMS BIT \_\_\_\_\_

BIT FAILURES AND QUALITATIVE FUNCTIONAL ASSESSMENT OF

SMS/RESULTS OF GROUND MAINTENANCE CHECKS: